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Specification

(Reference)

Title: FIXED THICK FILM CHIP RESISTORS; RECTANGULAR TYPE & HIGH OHM

Style: RHC16,20

RoHS COMPLIANCE ITEM
Halogen and Antimony Free

Product specification contained in this specification
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Issue Dept.: Research & Development Department Hokkaido Research Center

1. Scope

1.1 This specification covers the detail requirements for fixed thick film chip resistors; rectangular type & high ohm, style of RHC16,20.

1.2 Applicable documents

JIS C 5201: 1994, JIS C 5202: 1990

2. Classification

Type designation shall be the following form.

(Example)

RHC	20	10G0	M	TP
1	2	3	4	5
Style				

1 Fixed thick film chip resistors; rectangular type & high ohm — Style
2 Size
3 Rated resistance Example; 10G0 → 10GΩ
4 Tolerance on rated resistance
5 Packaging form

3. Rating

3.1 The ratings shall be in accordance with Table–1.

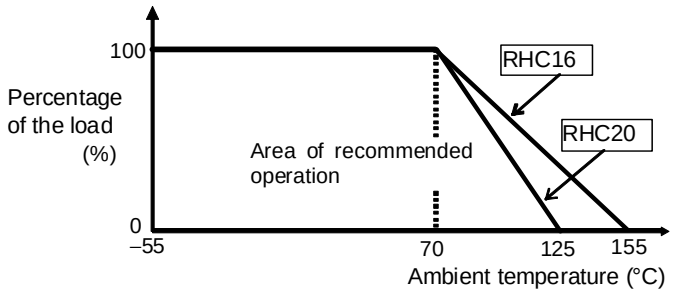
Table–1

Style	Rated voltage (V)	Temperature coefficient of resistance (10^{-6}/°C)	Rated resistance range (Ω)	Tolerance on rated resistance	Preferred number series for resistors	Isolation voltage (V)
RHC16	15	0~–2,000	100M~270M	J(±5%)	E12	100
			100M~4G	K(±10%)		
			100M~150G	M(±20%), N(±30%), H(±50%)		
RHC20		±2,000	100M~1G	J(±5%), K(±10%)		
			100M~10G	M(±20%), N(±30%), H(±50%)		
		±4,000	100G~150G			

Style	Working temperature range(°C)
RHC16	–55~+155
RHC20	–55~+125

3.2 Derating

The derated values of load at temperature in excess of 70 °C shall be as indicated by the following curve.



Figure–1 Derating curve

4. Packaging form

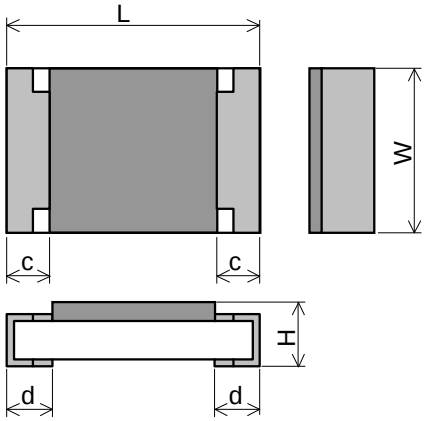
The standard packaging form shall be in accordance with Table–2.

Table–2

Symbol	Packaging form		Standard packaging quantity / units
B	Bulk (loose package)		1,000 pcs.
TP	Paper taping	8mm width, 4mm pitches	5,000 pcs.

5. Dimensions

5.1 The resistor shall be of the design and physical dimensions in accordance with Figure–2 and Table–3.



Figure–2

Table–3 Unit: mm

Style	L	W	H	c	d
RHC16	1.6±0.1	$0.8^{+0.15}_{-0.05}$	0.45±0.10	0.3±0.1	0.3±0.1
RHC20	2.0±0.1	1.25±0.10	0.55±0.10	0.4±0.2	0.4±0.2

5.2 Net weight (Reference)

Style	Net weight(mg)
RHC16	2
RHC20	5

6. Performance

6.1 The standard condition for tests shall be in accordance with Sub–clause 3, JIS C 5202: 1990.

6.2 The performance shall be satisfied in Table–4.

Table–4(1)

No.	Test items	Condition of test (JIS C 5202)	Performance requirements
1	DC resistance	Sub–clause 5.1 Measuring voltage: 15 V	Within the specified tolerance of rated resistance.
2	Temperature characteristics of resistance	Sub–clause 5.2 Test condition: 5 °C / 35 °C	See table–1.
3	Voltage coefficient	Sub–clause 5.3 Measuring voltage: 5 V / 15 V	RHC16 100MΩ≤R<100GΩ: Within ±1 %/V 100GΩ≤R≤150GΩ: Within ±2 %/V RHC20 100MΩ≤R≤10GΩ: Within 0~–2 %/V 100GΩ≤R≤150GΩ: Within ±10 %/V
4	Insulation resistance	Sub–clause 5.6 The resistor shall be fixed on the test fixture as shown in Figure–4. Test potential: 100 Vdc Test period: 1 min.	10 TΩ min.
5	Capacitance	Measuring voltage: 1 V Measuring frequency: 10 kHz, 100kHz, 1MHz	1 pF max.

Table–4(2)

No.	Test items	Condition of test (JIS C 5202)	Performance requirements
6	Terminal strength (Pulling test)	Lead wire (RHC16: ϕ0.4 mm, RHC20: ϕ0.47 mm) shall be soldered to the center of terminal. One side is fixed and the specified load shall be applied to the other side in the direction of axial. Duration: 10 s ± 1 s	Not be peeled off by the pulling force under 5 N. RHC16: 3 N
7	Substrate bending test	Sub–clause 6.1.4 (1) The resistor shall be mounted on the test substrate as shown in Figure–3. Bending value: 5 mm (Among the fulcrums: 90 mm) Duration: 10 s ± 1 s	No evidence of mechanical damage.
8	Resistance to soldering heat	Sub–clause 6.10 Test by a piece. Temp. of solder bath: 260 °C ± 5 °C Immersion time: 10 s ± 1 s After immersion into solder, leaving at the room temp. for 1h or more and then measure the resistance.	RHC16 100MΩ≤R≤10GΩ: Within ±1 % 10GΩ<R≤150GΩ: Within ±2 % RHC20 100MΩ≤R≤10GΩ: Within ±1 % 100GΩ≤R≤150GΩ: Within ±5 % No evidence of appearance damage
9	Solderability	Sub–clause 6.11 Test by a piece. Flux: Rosin–Methanol Temp. of solder bath: 235 °C ± 5 °C Immersion time: 2 s ± 0.5 s	The surface of terminal immersed shall be min. of 95% covered with a new coating of solder.
10	Temperature cycling	Sub–clause 7.4 Test cycle: 5 cycles for duty cycle as specified below.	RHC16 100MΩ≤R≤10GΩ: Within ±1 % 10GΩ<R≤150GΩ: Within ±2 % RHC20 100MΩ≤R≤10GΩ: Within ±1 % 100GΩ≤R≤150GΩ: Within ±5 % No evidence of appearance damage

Step	Temperature (°C)	Time (min)
1	Room temp.	2~3
2	–55±3	30
3	Room temp.	2~3
4	RHC16: 155±2 RHC20: 125±2	30

11	Humidity	Sub–clause 7.5 Test temp. & relative humidity: 40 °C ± 2 °C & 90~95 % Test period: 1,000 $^{+48}_{0}$ h	RHC16 100MΩ≤R≤10GΩ: Within ±2 % 10GΩ<R≤150GΩ: Within ±5 % RHC20 100MΩ≤R≤10GΩ: Within ±2 % 100GΩ≤R≤150GΩ: Within ±5 % No evidence of appearance damage
12	Load life	Sub–clause 7.10 Test temp. & relative humidity: 70 °C ± 2 °C Test voltage: Cycle of 1 h 30 min. ″ON″ and 30 min. ″OFF″ at dc rated voltage. Test period: 1,000 $^{+48}_{0}$ h	RHC16 100MΩ≤R≤10GΩ: Within ±3 % 10GΩ<R≤150GΩ: Within ±5 % RHC20 100MΩ≤R≤10GΩ: Within ±3 % 100GΩ≤R≤150GΩ: Within ±20 % No evidence of appearance damage

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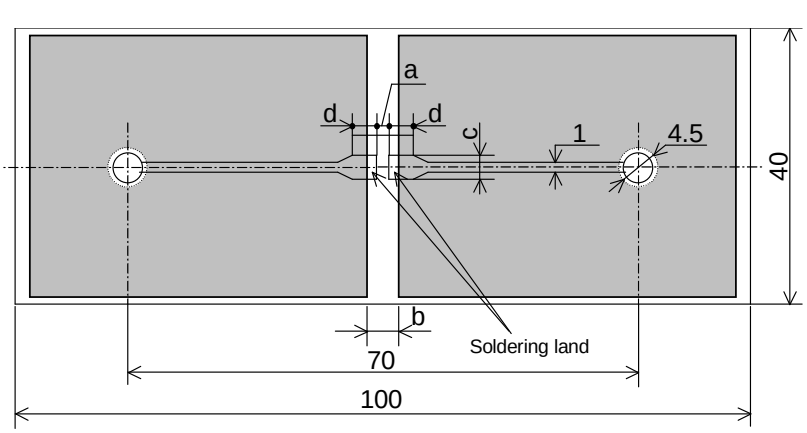
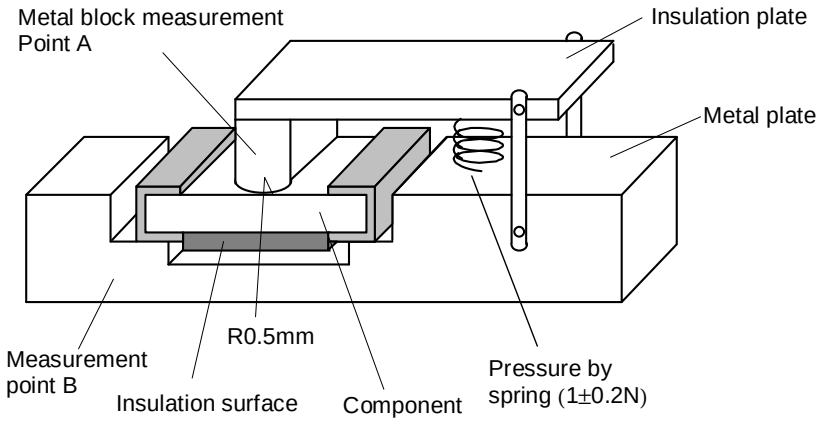
7. Test substrate



Style	a	b	c	d
RHC16	1.0	3.6	1.2	3.0
RHC20	1.2	4.0	1.65	3.0

Figure–3 RHC BOUND STRENGTH OF THE END FACE PLATING TEST SUBSTRATE

Remark 1). Material: Epoxide woven glass
Thickness: 1.6mm Thickness of copper clad: 0.035mm



Figure–4

8. Taping

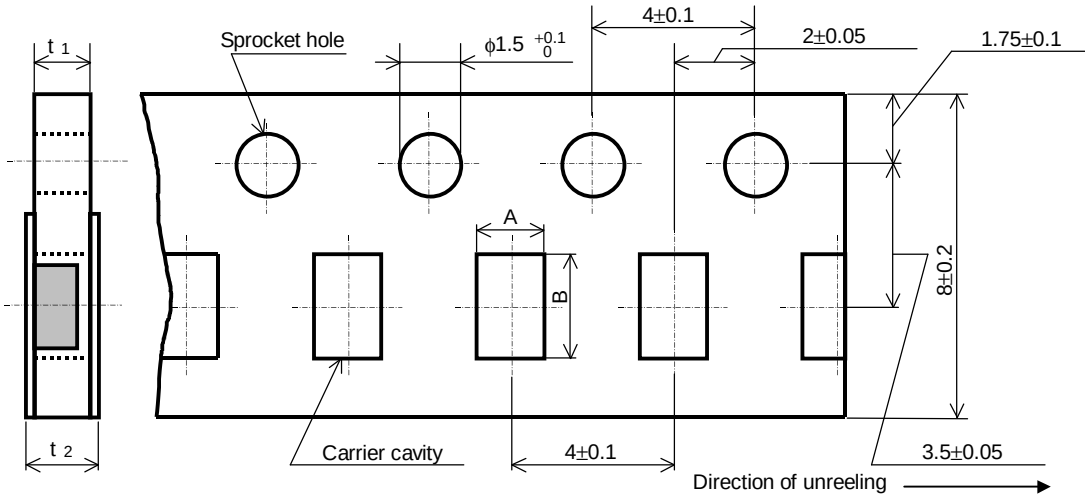
8.1 Applicable documents JIS C 0806–3: 1999, EIAJ ET–7200B: 2003

8.2 Taping dimensions

Paper taping (8mm width, 4mm pitches)

Taping dimensions shall be in accordance with Figure–5 and Table–5.

Unit: mm



Figure–5

Table–5 Unit: mm

Style	A	B	t_1	t_2
RHC16	1.15±0.15	1.9±0.2	0.6±0.1	0.8max.
RHC20	1.65±0.15	2.5±0.2	0.8±0.1	1.0max.

1). The cover tapes shall not cover the sprocket holes.

2). Tapes in adjacent layers shall not stick together in the packing.

3). Components shall not stick to the carrier tape or to the cover tape.

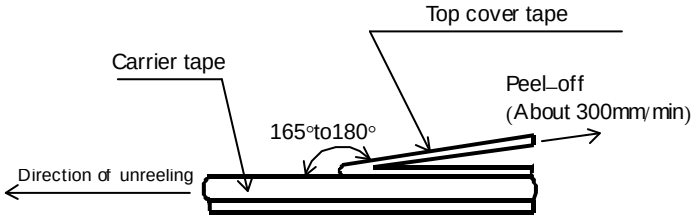
4). Pitch tolerance over any 10 pitches ±0.2mm.

5). The peel strength of the top cover tape shall be with in 0.1N to 0.5N on the test method as shown in the following Figure–6.

6). When the tape is bent with the minimum radius for 25 mm, the tape shall not be damaged and the components shall maintain their position and orientation in the tape.

7). In no case shall there be two or more consecutive components missing.
The maximum number of missing components shall be one or 0.1%, whichever is greater.

8). The resistors shall be faced to upward at the over coating side in the carrier cavity.



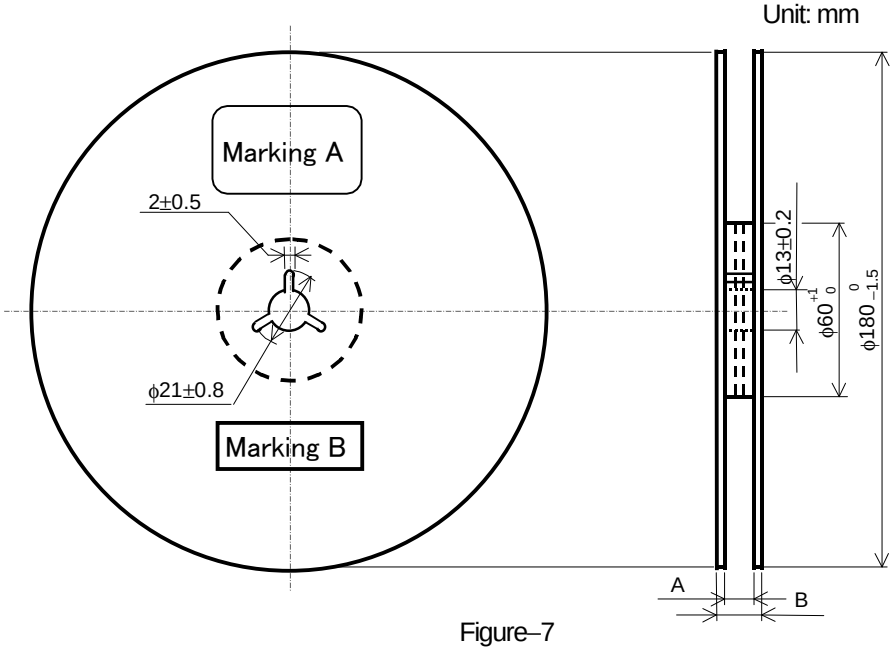
Figure–6

8.3 Reel dimension

Reel dimensions shall be in accordance with the following Figure–7 and Table–6.

Plastic reel (Based on EIAJ ET–7200B)

Unit: mm



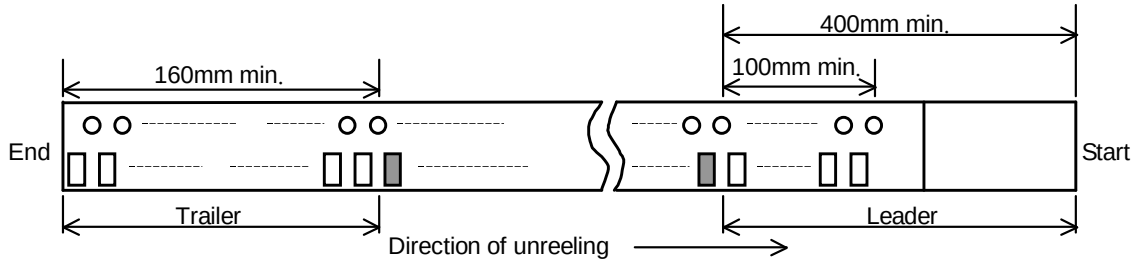
Figure–7

Table–6 Unit: mm

Style	A	B	Note
RHC16, 20	9 $^{+1.0}_{0}$	11.4±1.0	Injection molding
		13±1.0	Vacuum forming

Note: Marking label shall be marked on a place of Marking A or two place of marking A and B.

8.4 Leader and trailer tape.



Figure–8

9. Marking on package

The label of a minimum package shall be legibly marked with follows.

9.1 Marking A

(1) Classification (Style, Rated resistance, Tolerance on rated resistance, Packaging form)

(2) Quantity (3) Lot number (4) Manufacturer's name or trade mark (5) Others

9.2 Marking B (KAMAYA Control label)

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Kamaya:

RZC63-105JTE RZC50-156JTE RPC32100MTP RPC504R7KTE RPC20182MTP RPC63471KTE RPC35150MTE RPC35275MTE RPC321R1MTP RPC20122KTP RPC35104JTE RPC20152JTP RPC63101KTE RPC202R7MTP RPC20330JTP RPC20182JTP RPC35113MTE RPC50111JTE RPC63221KTE RPC35303JTE RPC32102JTP RPC63470KTE RPC35200JTE RPC20161MTP RPC50331MTE RPC50270JTE RPC35244MTE RPC32104JTP RPC35820JTE RPC20153KTP RPC35150JTE RPC35305MTE RPC63470JTE RPC50511MTE RPC20100JTP RPC63390KTE RPC32220KTP RPC35135JTE RPC35120JTE RPC63183JTE RPC63101JTE RPC20102KTP RPC20751MTP RPC35100JTE RPC32332JTP RPC63100JTE RPC35115MTE RPC50100KTE RPC32104MTP RPC321R0JTP RPC503R0JTE RPC63181JTE RPC32435JTP RPC32755MTP RPC35244JTE RPC35303MTE RPC503R3JTE RPC20334JTP RPC632R2JTE RPC63106JTE RHC2010G0MTP RHC161G20HTP RHC16100MJTP RHC20330MKTP RHC162G20HTP RHC168G20MTP RHC20100GMTP RHC205G60HTP RHC16100MKTP